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Christopher Haydn Lowery

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EXAMINER

KANG, DONGHEE

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/938,407

Applicant(s)

LOWERY ET AL.

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 16-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15, 22-24, 27-42 and 44 is/are rejected.
- 7) ☒ Claim(s) 14, 25, 26 and 43 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Acknowledgment*

1. Applicant's Amendment and Response to paper No.9 have been entered and made of Record. New claims 22-44 are added.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims **1-2, 4-7, 9-12 & 22, 24, 29-30, 32-42 & 44** are rejected under 35 U.S.C. 102(e) as being anticipated by Collins, III et al. (US 2002/0187571).

Re claims **1 & 27**, Collins et al. teach a light emitting device comprising (Figs.4 & 8A):

a light emitting diode (10); a submount (28); a phosphor material (12, Fig.8A) disposed around at least a portion of said light emitting diode; and

an underfill material (66, Fig.4B) between a first surface of the light emitting diode and a first surface of the submount. Collins et al. do not expressly teach that the underfill has characteristics to reduce contamination of the light emitting diode by the phosphor material. However, it is inherent in Collins's device because the underfill of Collins comprises a same material with the present invention. Therefore, the underfill of

Collins also has characteristics to reduce contamination of the light emitting diode by the phosphor material.

Re claim **2**, Collins et al. teach the light emitting diode having a reflective layer (24, Fig.8A).

Re claim **4**, Collins et al. teach the submount comprising a silicon substrate (paragraph 0021).

Re claims **5 & 6**, Collins et al. teach the phosphor material comprising strontium sulfide (paragraph 0026).

Re claim **7**, Collins et al. teach the phosphor material comprising a gettering compound, the gettering compound comprising a gettering ion and a counter-ion, said gettering ion comprising organic ligands.

Re claims **9-10 & 29-30**, Collins et al. teach the underfill comprising silicon dioxide (paragraph 0028).

Re claims **11 & 32**, Collins et al. do not expressly teach the filler is reflective. However, the filler material of Collins would have same function as applicant's claimed term "reflective" because it has precisely the same material (AlO, SiO or SiN).

Re claims **12, & 34-38**, Collins et al. teach the underfill comprising a gettering compound, the gettering compound comprising a gettering ion and a counter-ion, said gettering ion comprising a group IVA material (silicon).

Re claim **24**, Collins et al. teach the light emitting diode is mounted on the submount.

Re claim **33**, Collins et al. teach the underfill completely fills the space between the semiconductor light emitting device and the submount.

Re claims **22 & 39**, Collins et al. teach the counter ion is one of sulfate and citrate.

Re claim **40**, Collins et al. teach the semiconductor light emitting device includes a contact comprising silver.

Re claim **41**, Collins et al. teach the phosphor comprising a material selected from a group consisting of strontium thiogallate, calcium thiogallate, strontium sulfide, and any combination thereof.

Re claims **42 & 44**, Collins et al. teach the phosphor comprising a sulfur compound.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim **3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (US 2002/0187571) in view of Shiozaki (US 6,132,569).

Collins et al. teach the light emitting device comprising reflective layer but not teach the reflective layer comprising silver. Shiozaki teaches silver can be used for the reflective layer for reflecting light (Col.2, lines 29-30).

Therefore, it would have been obvious to one of ordinary skill in the art to form the reflective layer using silver as taught by Shiozaki, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. In re Leshin, 125 USPQ 416.

6. Claims **8 & 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins III et al. in view of Bhat et al. (US 6,455,878).

Collins et al. teach the underfill comprises an organic material but not epoxy resin. However, it is conventional material for filler and also Bhat teach using epoxy resin (60) as a filler material (Col.4, line 56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the filler material of Collins with the epoxy resin as taught by Bhat since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. In re Leshin, 125 USPQ 416.

7. Claim **13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins III et al. in view of Mine et al. (US 5,561,329)

Collins et al. do not teach the underfill further comprising fumed silica. However, Mine et al. teach that an inorganic filler such as fumed silica, can be added in order to improve the mechanical strength of the final cured product (Col.8, lines 41-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Mine into the Collins's device in order to improve the mechanical strength of the final cured product.

8. Claim **15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins, III et al. (US 2002/0187571).

Collins et al. teach the underfill comprising the gettering ion and a sulfide ion but do not expressly teach that the gettering ion and the sulfide ion form a compound with a solubility product less than about 10-30. However, this feature is inherent in Collins's device because the underfill material of Collins is identical to the instant claimed invention. Collins et al. do not expressly teach the compound with solubility product less than about 10-30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the solubility of the compound, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

#### ***Allowable Subject Matter***

9. Claims **14, 25-26 & 43** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art reference, taken along or in combination, do not teach or render obvious that the gettering ion comprising a material selected from a group consisting of

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chrominum, molybdenum, tungsten, vanadium, niobium, bismuth, hafnium, lead, and any combination thereof.

### ***Response to Arguments***

10. Applicant's arguments filed October 14, 2003 have been fully considered but they are not persuasive. Applicant argues that the material of Collins does not teach reducing contamination. However, it is inherent in Collins's device because the underfill of Collins comprises a same material with the present invention. Therefore, the underfill of Collins also has characteristics to reduce contamination of the light emitting diode by the phosphor material.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 703-308-1690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Donghee Kang  
Examiner  
Art Unit 2811

dhk